

X_1	Y_1	Z_1	x	y	A_1	B_1	C_1	a	b	c	L^*	a^*	b^*	C^*ab	$\log 1+A_1$	$\log 1+B_1$	$\log 1+C_1$	OYLCVM_0M_0	
CIE Illuminant E																			
0.614	0.357	0.0	0.632	0.367	0.257	0.142	0.294	0.71	0.39	0.82	66.3	70.3	113.7	133.7	0.099	0.057	0.112	%0=JR	00 575 770
0.831	0.667	0.015	0.855	0.505	-0.039	0.34	0.342	-0.84	0.39	0.39	94.6	-6.6	140.9	141.1	-0.015	0.127	0.127	%Y=J=JG+JR	01 515 770
0.216	0.509	0.015	0.282	0.587	-0.293	0.197	0.352	-0.57	0.39	0.79	76.6	-99.1	110.4	149.3	-0.15	0.131	0.131	%L=JG	02 515 575
0.085	0.25	0.01	0.19	0.561	-0.169	0.055	0.174	-0.66	0.22	0.69	57.1	-95.3	30.0	99.9	-0.078	0.023	0.069	%S	03 0, 35°JG+0, 65°BG
0.014	0.11	0.162	0.049	0.385	-0.096	0.02	0.098	-0.87	-0.18	0.89	39.7	-119.2	-13.0	119.9	-0.044	-0.009	0.04	%Cs=BG	04 475 515
0.168	0.132	0.984	0.13	0.103	0.935	-0.34	0.342	0.26	-2.57	2.58	43.1	21.1	-96.9	99.2	0.015	-0.18	0.129	%V=BR+BG	05 380 515
0.154	0.021	0.822	0.154	0.021	0.132	-0.32	0.346	0.69	-14.7315	94	16.3	128.5	-131.5183	9.9	0.054	-0.167	0.227	%Ms=BR	06 380 475
0.55	0.31	0.115	0.563	0.318	0.239	0.078	0.252	0.77	0.25	0.81	62.5	71.1	38.0	80.7	0.093	0.032	0.097	%Rs	07 0, 14°BR+0, 86°JR
0.614	0.357	0.0	0.632	0.367	0.257	0.142	0.294	0.71	0.39	0.82	66.3	70.3	113.7	133.7	0.099	0.057	0.112	%0=JR	08 575 770
0.001	0.001	0.001	0.332	0.332	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%N0 (β=0,001)	09 380 770
1.0	1.0	1.0	0.333	0.333	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	%M1 (β=1,000)	10 380 770
CIE Standard Illuminant D65																			
0.548	0.323	0.0	0.628	0.37	0.241	0.14	0.279	0.74	0.43	0.86	63.6	73.0	109.1	131.3	0.093	0.057	0.106	%0=JR	00 575 770
0.768	0.852	0.016	0.469	0.52	-0.049	0.364	0.367	-0.84	0.42	0.43	94.0	-8.2	140.2	140.5	-0.018	0.135	0.135	%Y=J=JG+JR	01 515 770
0.22	0.529	0.016	0.288	0.69	-0.282	0.224	0.36	-0.53	0.42	0.68	77.8	-97.1	112.7	148.8	-0.144	0.087	0.133	%L=JG	02 515 575
0.087	0.264	0.125	0.183	0.554	-0.163	0.065	0.176	-0.61	0.24	0.66	58.5	-95.0	31.2	100.0	-0.077	0.027	0.07	%S	03 0, 35°JG+0, 65°BG
0.016	0.12	0.183	0.052	0.324	-0.12	0.025	0.025	0.25	-0.16	0.83	41.5	-119.5	-11.2	119.8	-0.045	-0.008	0.042	%Cs=BG	04 475 515
0.181	0.147	1.072	0.129	0.105	0.941	-0.360	0.367	0.28	-2.47	2.49	45.2	23.9	-93.3	96.4	0.015	-0.197	0.135	%V=BR+BG	05 380 515
0.165	0.024	0.888	0.153	0.023	0.141	-0.340	0.372	0.57	-13.8715	0	17.8	133.2	-128.5185	1.0	0.057	-0.183	0.137	%Ms=BR	06 380 475
0.494	0.281	0.124	0.459	0.312	0.227	0.072	0.238	0.8	0.25	0.84	60.0	74.5	33.9	81.8	0.088	0.03	0.092	%Rs	07 0, 14°BR+0, 86°JR
0.548	0.323	0.0	0.628	0.37	0.241	0.14	0.279	0.74	0.43	0.86	63.6	73.0	109.1	131.3	0.093	0.057	0.106	%0=JR	08 575 770
0.0	0.001	0.001	0.311	0.312	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%N0 (β=0,001)	09 380 770
0.95	1.0	1.088	0.312	0.329	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	%M1 (β=1,000)	10 380 770
CIE Illuminant D50																			
0.609	0.354	0.0	0.632	0.367	0.268	0.116	0.292	0.75	0.32	0.82	66.0	75.4	113.1	135.9	0.103	0.047	0.111	%0=JR	00 575 770
0.829	0.873	0.015	0.482	0.508	-0.012	0.281	0.282	-0.81	0.32	0.32	94.8	-2.3	137.9	137.9	-0.005	0.107	0.107	%Y=J=JG+JR	01 515 770
0.22	0.519	0.015	0.291	0.688	-0.28	0.165	0.325	-0.54	0.31	0.62	77.2	-96.2	107.9	144.6	-0.143	0.066	0.122	%L=JG	02 515 575
0.085	0.251	0.106	0.193	0.566	-0.150	0.04	0.161	-0.62	0.16	0.64	57.2	-92.3	25.2	95.7	-0.074	0.017	0.065	%S	03 0, 35°JG+0, 65°BG
0.013	0.107	0.155	0.049	0.388	-0.09	0.020	0.093	-0.83	-0.24	0.87	39.1	-117.0	-19.5	118.6	-0.041	-0.011	0.039	%Cs=BG	04 475 515
0.134	0.126	0.809	0.125	0.118	0.912	-0.289	0.282	0.09	-2.22	2.22	42.2	8.1	-98.3	98.6	0.005	-0.143	0.187	%V=BR+BG	05 380 515
0.12	0.017	0.817	0.152	0.024	0.12	-0.250	0.275	0.251	-13.3514	38	15.0	135.5	-131.6135	8	0.042	-0.128	0.135	%Ms=BR	06 380 475
0.541	0.307	0.091	0.575	0.326	0.245	0.064	0.253	0.79	0.21	0.82	62.2	75.0	38.7	84.4	0.095	0.027	0.098	%Rs	07 0, 14°BR+0, 86°JR
0.609	0.354	0.0	0.632	0.367	0.268	0.116	0.292	0.75	0.32	0.82	66.0	75.4	113.1	135.9	0.103	0.047	0.111	%0=JR	08 575 770
0.0	0.0	0.0	0.344	0.357	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%N0 (β=0,001)	09 380 770
0.964	1.0	0.824	0.345	0.358	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	%M1 (β=1,000)	10 380 770
CIE Standard Illuminant A																			
0.835	0.467	0.0	0.64	0.358	0.321	0.066	0.328	0.68	0.14	0.7	74.0	68.2	125.5	142.9	0.121	0.027	0.123	%0=JR	00 575 770
1.043	0.925	0.012	0.526	0.467	0.027	0.126	0.129	0.02	0.13	0.14	97.0	4.2	130.1	130.2	0.011	0.051	0.052	%Y=J=JG+JR	01 515 770
0.208	0.458	0.011	0.307	0.675	-0.290	0.06	0.3	-0.64	0.13	0.65	73.4	-97.9	90.3	133.2	-0.151	0.025	0.114	%L=JG	02 515 575
0.077	0.203	0.059	0.228	0.597	-0.149	0.005	0.145	-0.71	0.02	0.71	52.2	-87.2	7.5	87.5	-0.068	0.002	0.059	%S	03 0, 35°JG+0, 65°BG
0.007	0.066	0.085	0.045	0.418	-0.065	0.024	0.07	-0.99	-0.37	1.05	39.9	-108.0	-43.1	116.3	-0.029	-0.01	0.029	%Cs=BG	04 475 515
0.054	0.074	0.343	0.115	0.157	-0.027	0.120	0.129	-0.36	-1.7	1.74	32.7	-26.3	-113.6116	6	-0.011	-0.058	0.052	%V=BR+BG	05 380 515
0.047	0.008	0.258	0.151	0.025	0.038	-0.102	0.109	4.81	-12.7513	63	7.2	75.2	-139.7158	7	0.016	-0.046	0.045	%Ms=BR	06 380 475
0.724	0.483	0.036	0.622	0.346	0.281	0.042	0.285	0.69	0.1	0.7	69.7	65.9	54.0	85.2	0.107	0.018	0.108	%Rs	07 0, 14°BR+0, 86°JR
0.835	0.467	0.0	0.64	0.358	0.321	0.066	0.328	0.68	0.14	0.7	74.0	68.2	125.5	142.9	0.121	0.027	0.123	%0=JR	08 575 770
0.001	0.0	0.0	0.445	0.405	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%N0 (β=0,001)	09 380 770
1.098	0.999	0.355	0.447	0.407	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	%M1 (β=1,000)	10 380 770

$$A = [(X/X_n) - (Y/Y_n)]Y = [a - a_n]Y \quad B = -0.4[(Z/Z_n) - (Y/Y_n)]Y = -0.4[b - b_n]Y \quad a = X/Y = x/y \quad b = -0.4Z/Y = -0.4z/y \quad (X, Y, Z \geq 0.89)$$

$$a^* = 500 [(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] \quad b^* = 200 [(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] \quad a' = (1/X_n)^{1/3} (x/y)^{1/3} \quad b' = -0.4 (1/Z_n)^{1/3} (z/y)^{1/3} \\ = 500 (a' - a_n') Y^{1/3} \quad = 500 (b' - b_n') Y^{1/3} \quad = 0.2191 (x/y)^{1/3} \quad = -0.08376 (z/y)^{1/3} \quad \text{CIE LAB for } n=D65$$